Abstract

Title: Relation between selected off-ice tests, somatotype and performance in on-ice Illinois Agility tests in junior ice hockey players from Czech elite category.

Objective: The aim of this thesis was to verify whether the somatotype and off-ice tests are significant predictors for performance in on-ice agility tests in junior ice hockey players from Czech elite category.

Methods: The research sample consisted of 32 junior hockey players (17 defenders and 15 forwards) $\bar{x}$ = 17.64 ± 1.02 from Czech elite category. The Heath and Carter (1990) method for measuring of somatotype was used. The off-ice tests included Squat Jump, Countermovement Jump, Free Arm Countermovement Jump, Broad Jump, Five-Jump test, Sit and Reach, Pull-ups and off-ice Illinois Agility with (small size) ball. Further, on-ice Illinois Agility with puck and Illinois Agility without puck were used as dependent variables. The differences in performance between defenders and forwards were analysed by Aspin-Welch's two-sample T-test with Effect size (ES) *Hedges's g.* The degree of significance of the predictors for dependent variables in on-ice agility tests was assessed by multiple regression analysis with significance of model at the level of $p<0.05$ and ES described as adjusted R^2.

Results: Comparison of the results achieved by defenders and forwards revealed that the defenders had a higher endomorphy (relative fatness) with moderate ES *Hedges's g* = 0.45 and had more muscle mass on the limbs. In contrast, the forwards were significantly more skeletally robust on both upper and lower limbs *Hedges's g* = 0.39 – 0.61. In motor tests, the defenders had a better level of lower limbs explosiveness in the Countermovement Jump ES *Hedges's g* = 0.46; Free Arm Countermovement Jump test *Hedges's g* = 0.38.

On the other hand, there were no significant differences in the on-ice tests regarding players' positions. A further regression analysis showed that none of somatotype components is significant predictors for on-ice performance; however, it was revealed that the off-ice Illinois Agility test with ball is the main predictor in the on-ice Illinois Agility without puck performance (b = 0.32) (F = 3.27; $p<0.01$) as well as in the on-ice Illinois Agility with puck. Moreover, we also revealed that in addition to off-ice Illinois Agility with ball the skeletal robustness on the lower limbs FrameD is a significant predictor for the on-ice Illinois Agility with puck (F = 11.9;

p <0.001). This model explained the R^2 model = 41 % of variance of dependent variable. This model also showed that the off-ice Illinois Agility with ball (R^2 = 24 %; p <0.01) was suggested as more important than FrameD (R^2 = 10 %; p <0.05).

Conclusion: These results suggest that somatic parameters of active muscle mass and skeletal robustness should be considered important in long-term player monitoring. Likewise, outside training sessions, players should have a free off-ice game, which significantly contributes to the acquisition of specific hockey skills applied on ice.

Keywords: ice hockey, somatotype, off-ice tests, on-ice tests, Illinois Agility test